



# Incorrect stonefish envenomation first aid treatment information on medical websites

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## Introduction

The use of the internet as a source of medical information has become increasingly popular. Reliable and accurate web-based health information is extremely valuable. People use the internet for several reasons: to obtain information that they could not get from their physicians, to verify a medical opinion or treatment, and to overcome reticence in discussing personal issues<sup>1)2)</sup>. Although plenty of health information is available on the internet, physicians and patients should be aware that the quality of this online information varies greatly. However, we increasingly encounter patients who present to the emergency department with incorrect treatment information obtained from the internet.

Stonefish envenomation, often occurring in individuals engaged in marine sports, seafood handlers, and fishermen, is usually self-limiting without significant consequences. The stonefish venom verrucotoxin is an unstable protein with a pH of 6.0 and a molecular weight of 150,000. Laboratory studies have shown that the venom contains a proteinaceous toxin that is myotoxic, neurotoxic, vasopermeable, and cardiotoxic<sup>3)</sup>. Stonefish venom is heat labile, and immersion of the affected area in hot water should provide pain relief, resulting in a loss of toxicity. However, we experi-

enced several patients with stonefish envenomation who had burns on the affected sites by incorrect self-treatment. These patients obtained incorrect medical information regarding first aid treatment for stonefish envenomation from Japanese websites.

The aim of this study was to evaluate the quality of web-based medical stonefish envenomation information for the non-medical population in Japan. This report may help healthcare experts working in primary emergency departments to realize that web-based first aid information can be incorrect and sometimes harmful to patients.

## Methods

### Stonefish envenomation and appropriate first aid

The first 100 websites written in Japanese were retrieved from a search on Google Japan or Yahoo! Japan, the most frequently used search engines in Japan, using the key words “stonefish,” “treatment,” and “envenomation” in Japanese between March 12, 2009 and March 17, 2009. Total 100 websites (50 from Google Japan and 50 websites from Yahoo! Japan) including duplications were evaluated. The same internet searches were repeated between October 29 and November 3, 2012. The content of the websites was evaluated by two experienced emergency physicians.

According to information provided by the Japanese Poison Information Center<sup>4)</sup> and other documents<sup>5)6)</sup>, it has been recommended that the affected site be immersed in non-scalding hot water (45 °C) for 30 to 90 minutes or until the pain subsides. Studies have concluded that hot water soaks are effective in controlling the pain in 74% of cases<sup>7)</sup>. Any retained spines should be removed as early as possible because they may continue to envenomate and increase risk of secondary infection. Radiographs and ultrasound should be used to identify possible retained foreign bodies, and surgical exploration may be necessary. Antibiotic therapy is recommended for all puncture wounds of the hand and foot because of the high incidence of infection<sup>8)</sup>. Medical staff must explain the possibilities of antivenom treatment or topical anesthetics and the danger of infection, as well as the necessity of tetanus booster vaccination. Administration of oral or parenteral opioid analgesics or local infusion of lidocaine can be considered.

If the website represented this information, we determined the website as “accurate”. If the contents of the websites were different from this information, we determined as “incorrect”.

## Results

Based on an updated search performed in October 2012, only 19 websites related to stonefish envenomation contained fair information on appropriate first aid. Twenty-nine websites advocated inappropriate treatment protocols, such as ice pack or cold water application, which is different from published guidelines, but not harmful. Only 4% of the websites had links to the appropriate references. Forty-nine websites provided incorrect information (Table 1). On these websites, incorrect methods of stonefish envenomation treatment were described, including roasting the site on a fire or administering a hot water bath (higher than 60 °C). Twenty-one websites were created by medical authorities. Of the 100 web-

**Table 1 Accuracy of information (frequency)**

	March 2009	October 2012
Accurate	26/100	19/100
Incorrect but not harmful	32/100	29/100
Incorrect and harmful	31/100	49/100
Not shown	11/100	3/100

sites, 31 listed their identities and attributions. Interestingly, 14 of those 31 websites that identified themselves provided correct information, while 64 of the 69 unidentified websites posted incorrect information. A similar search performed in March 2009 demonstrated similar tendencies. Incorrect and harmful information was posted on 31% of the websites. Likewise, 81% of the unidentified websites provided incorrect information (Table 2).

## Discussion

The internet has enabled us to easily access the answers to health-related questions. We found that the internet may provide wrong or even harmful stonefish envenomation information to the public. The pain of envenomation is notoriously intense and immediate, increasing over the first 10 minutes after exposure. Swelling follows the pain and can often be severe. Usually, patients will not seek medical assistance unless clinical signs are severe. Therefore, we only find patients with severe clinical symptoms following stonefish envenomation. Life-threatening complications may occur after insect bites or snake bites if patients follow incorrect treatment instructions. Primary care providers should recognize that patients use the internet as a source of medical and health information, and should be prepared to properly inform patients who receive distorted information from the internet. Also, healthcare professionals must suggest web-based health resources and assist patients in evaluating the quality of web-based medical information. Essentially, web-based information about toxins should be revised dynamically and constantly, since moderators for the websites have the

**Table 2 Affiliation and accuracy (frequency)**

	March 2009	October 2012
Identified medical authority	29/100 (16 correct, 13 incorrect)	21/100 (11 correct, 10 incorrect)
Identified non-medical personnel	28/100 (2 correct, 26 incorrect)	10/100 (3 correct, 7 incorrect)
Anonymous	43/100 (8 correct, 35 incorrect)	69/100 (5 correct, 64 incorrect)

ability to edit and expand content in real time. In addition, medical personnel should request that webmasters modify wrong information on the website, if the information is obviously wrong and risky to readers.

In conclusion, web based information about primary care for stonefish envenomation was incomplete (19% accurate) with limited web sources in Japan. Established and updated web sites should be necessary to prevent confusion among both patients and emergency physicians.

#### References

- 1) Diaz JA, Griffith RA, Ng JJ, et al : Patients' use of the Internet for medical information. *J Gen Intern Med* 2002 ; 17 : 180.
- 2) van Woerkum CM : The Internet and primary care physicians : Coping with different expectations. *Am J Clin Nutr* 2003 ; 77 : 1016S-8.
- 3) Yazawa K, Wang JW, Hao LY, et al : Verrucotoxin, a stonefish venom, modulates calcium channel activity in guinea-pig ventricular myocytes. *Br J Pharmacol* 2007 ; 151 : 1198.
- 4) Japan Poison Information Center.  
<http://www.j-poison-ic.or.jp/homepage.nsf> (11/6/2012)
- 5) Japanese Society for Clinical Toxicology : *Kyusei Cyudoku Hyojun Shinryo Guide*. Jiho, Tokyo, 2008, p655.
- 6) Dee Hodge III : *Dangerous Marine Bites, Stings, and Ingestions*. In : *Emergency Medicine*. 2nd ed, May HL ed, Little, Brown, Boston, 1992, p932.
- 7) Chen D, Kini RM, Yuen R, et al : Haemolytic activity of stonustoxin from stonefish (*Synanceja horrida*) venom : Pore formation and the role of cationic amino acid residues. *Biochem J* 1997 ; 325 : 685-91.
- 8) Atkinson PR, Boyle A, Hartin D, et al : Is hot water immersion an effective treatment for marine envenomation? *Emerg Med J* 2006 ; 23 : 503.